

I. Power section

Absolute maximum ratings		T _s = 25°C unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V _{CES}	Operating DC link voltage	600	V
V _{CC} ¹⁾		400	V
V _{GES}		± 20	V
I _C		400 (300)	A
T _s = 25 (70) °C			
Inverse diode			
I _F = -I _C	T _s = 25 (70) °C	400 (300)	A
I _{FSM}	T _j = 150 °C, t _p = 10ms; sin	4000	A
I ² t (Diode)	Diode, T _j = 150 °C, 10ms	80	kA ² s
T _j , (T _{stg})		-40 (-25) ...+150 (125)	°C
V _{isol}	AC, 1min.	2500	V

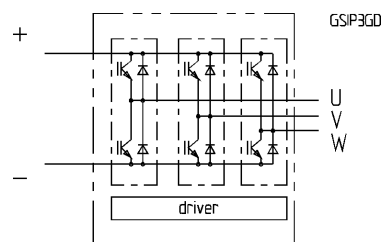
Characteristics							T _s = 25°C unless otherwise specified		
Symbol	Conditions				min.	typ.	max.	Units	
IGBT									
V _{CESat}	I _C = 400A, T _j = 25 (125)°C				–	2,3 (2,6)	2,6	V	
V _{CEO}	T _j = 25 (125) °C				–	0,8 (0,7)	1,0 (0,9)	V	
r _{CE}	T _j = 25 (125) °C				–	3,8 (4,8)	4,0 (5,0)	mΩ	
I _{CES}	V _{GE} =0, V _{CE} =V _{CES} , T _j =25(125) °C				–	(20)	0,4	mA	
E _{on} + E _{off}	I _C =400A, V _{CC} =300V				–	–	36	mJ	
	T _j =125°C V _{CC} =400V				–	–	53	mJ	
R _{CC'-EE'}	terminal chip, T _j = 125 °C				–	0,50	–	mΩ	
L _{CE}	top, bottom				–	15,0	–	nH	
C _{CHC}	per phase, AC-side				–	0,8	–	nF	
Inverse diode									
V _F = V _{EC}	I _F = 400A; T _j = 25(125) °C				–	1,5 (1,5)	1,8	V	
V _{TO}	T _j = 25 (125) °C				–	0,8 (0,6)	1,0 (0,8)	V	
r _T	T _j = 25 (125) °C				–	1,8 (2,2)	1,9 (2,3)	mΩ	
E _{RR}	I _C =400A V _{CC} =300V				–	–	13	mJ	
	T _j =125°C V _{CC} =400V				–	–	15	mJ	
Mechanical data									
M _{dc}	DC terminals, SI Units				6	–	8	Nm	
M _{ac}	AC terminals, SI Units				13	–	15	Nm	
w	SKiiP® 2 System w/o heat sink				–	2,7	–	kg	
w	heat sink				–	6,6	–	kg	
Thermal characteristics (P16 heat sink; 295 m³/ h); "r" reference to temperature sensor									
R _{thjrlGBT}	per IGBT				–	–	0,111	K/W	
R _{thjrdiode}	per diode				–	–	0,200	K/W	
R _{thra}	per module				–	–	0,036	K/W	
Z _{th}	R _i (mK/W) (max.)				tau _i (s)				
	1	2	3	4	1	2	3	4	
IGBT _{jr}	12	86	13	–	1	0,13	0,001	–	
diode _{jr}	22	154	24	–	1	0,13	0,001	–	
heatsink _{ra}	11,1	18,3	3,5	3,1	204	60	6	0,02	

SKiiP® 2

SK integrated intelligent Power 6-pack

SKiiP 402GD061-358CTV

Case S3



Features

- SKiiP technology inside
- low loss IGBTs
- CAL diode technology
- integrated current sensor
- integrated temperature sensor
- integrated heat sink
- IEC 60721-3-3 (humidity) class 3K3/IE32 (SKiiP® 2 System)
- IEC 68T.1 (climate) 40/125/56 (SKiiP® 2 power section)

1) with assembly of suitable MKP capacitor per terminal (SEMİKRON type is recommended)

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SKiiP 402GD061-358CTV

SKiiP 2®

SK integrated intelligent Power

SKiiP 402GD061-358CTV

II. Integrated gate driver

Absolute maximum ratings

Symbol	Term	Value	Unit
V _{S1}	stabilized 15V power supply	18	V
V _{S2}	unstabilized 24V power supply	30	V
V _{iH}	input signal voltage (high)	15 + 0,3	V
dv/dt	secondary to primary side	75	kV/μs
V _{isollO}	input / output (AC)	2500	Vac
V _{isol12}	output 1 / output 2 (AC)	1500	Vac
f _{max}	switching frequency	20	kHz
T _{op} (T _{stg})	operating / storage temperature	- 25 ... + 85	°C

Gate driver features

- CMOS compatible inputs
- wide range power supply
- integrated circuitry to sense phase current, heat sink temperature and DC-bus voltage (option)
- short circuit protection
- over current protection
- over voltage protection (option)
- power supply protected against under voltage
- interlock of top/bottom switch
- isolation by transformers
- fibre optic interface (option for GB-types only)
- IEC 68T.1 (climate) 25/85/56 (SKiiP® 2 gate driver)

Electrical characteristics (T_a = 25 °C)

Symbol	Term	Values			Units
		min	typ	max.	
V _{S1}	supply voltage stabilized	14,4	15	15,6	V
V _{S2}	supply voltage non stabilized	20	24	30	V
I _{S1}	V _{S1} = 15V	$340 + 490 \cdot f / f_{\max} + 3,5 \cdot (I_{AC}/A)$			mA
I _{S2}	V _{S2} = 24V	$250 + 360 \cdot f / f_{\max} + 2,6 \cdot (I_{AC}/A)$			mA
V _{iT+}	input threshold voltage (High)	11,2	–	–	V
V _{iT-}	input threshold voltage (Low)	–	–	5,4	V
R _{in}	input resistance	–	10	–	kΩ
t _{d(on)IO}	turn-on propagation time (system)	–	1,1	–	μs
t _{d(off)IO}	turn-off propagation time (system)	–	1,4	–	μs
t _{pERRRESET}	error memory reset time	9	–	–	μs
t _{TD}	top/bottom switch: interlock time	–	2,3	–	μs
I _{analogOUT}	8 V corresponds to	–	330	–	A
I _{Vs1outmax}	max. current of 15 V supply voltage (available when supplied with 24V)	–	–	50	mA
I _{AOmax}	output current at pin 13/20/22/24/26	–	–	5	mA
V _{ol}	logic low output voltage	–	–	0,6	V
V _{oH}	logic high output voltage	–	–	30	V
I _{TRIPSC}	over current trip level (I _{analog OUT} = 10V)	–	413	–	A
I _{TRIPLG}	ground fault protection	–	96	–	A
T _{tp}	over temperature protection	110	–	120	°C
U _{DCTRIIP}	trip level of U _{DC} -protection (U _{analog OUT} = 9V); (option)	400	–	–	V

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